AMENDMENTS TO THE CLAIMS

The listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method for ~~performing an~~ orthogonal code hopping multiplexing ~~communication in a band spreading~~ communications in spread spectrum ~~system using an orthogonal code~~ communication systems, the method comprising:

performing [[a]] statistical multiplexing for communication channels from a ~~first~~ primary communication station to ~~second~~ secondary communication stations by using orthogonal code hopping multiplexing and controlling the transmission of spread data symbols from the primary communication station based on the result of collision comparison performed within the primary communication station.

2. (Currently Amended) The method of claim 1,

wherein the communication channels from the ~~first~~ primary communication station to a the ~~second~~ secondary communication stations are synchronized to distinguish the communication channels by using orthogonality.

3. (Currently Amended) The method of claim 1, further comprising:

distinguishing the communication channels from the ~~first~~ primary communication station to the ~~second~~ secondary communication stations with use of orthogonal code hopping patterns.

4. (Cancelled)

5. (Previously Presented) The method of claim 1,

wherein the orthogonal code comprises a Hadamard code.

6. (Previously Presented) The method of claim 1,

wherein the orthogonal code comprises a variable spreading factor code.

7. (Currently Amended) The method of claim 1,

wherein the orthogonal code comprises a Gold ~~gold~~ code.

8. (Currently Amended) The method of claim 3, further comprising:

allocating the orthogonal code hopping pattern to the ~~second~~ secondary communication stations.

9. (Currently Amended) The method of claim 3,

wherein the orthogonal code hopping patterns are allocated to the ~~second~~ secondary communication stations from the ~~first~~ primary communication station when starting communication, and the ~~second~~ secondary communication stations return the orthogonal code hopping patterns when the communication is completed.

10. (Previously Presented) The method of claim 3, further comprising:

performing the orthogonal code hopping multiplexing for a channel from among the communication channels having a low transmission data activity.

11. (Currently Amended) The method of claim 3, further comprising:

transmitting a command for controlling transmission power of each of the ~~second~~ secondary communication stations using a separate common power control channel of the ~~first~~ primary communication station.

12. (Currently Amended) The method of claim 11,

wherein the transmission power control command of each ~~second~~ secondary communication station in the common power control channel is time-multiplexed and employs a ~~collision-resistant~~ collision-free hopping pattern for preventing collision of the hopping pattern.

13. (Currently Amended) The method of claim 12,

wherein the ~~collision resistant~~ collision-free hopping pattern comprises a fixed orthogonal ~~code symbol~~ codeword allocation.

14. (Currently Amended) The method of claim 3,

wherein the orthogonal code hopping patterns for the statistical multiplexing are generated ~~at random~~ independently.

15. (Currently Amended) The method of claim 14,

wherein the ~~random~~ independent code hopping patterns are generated using a pseudo-noise sequence generator.

16. (Currently Amended) The method of claim 3,

wherein a plurality of the orthogonal code hopping patterns for the statistical multiplexing are allocable to one of the ~~second~~ secondary communication stations according to a ~~send~~ transmission data rate of the ~~first~~ primary communication station.

17. (Previously Presented) The method of claim 16,

wherein each of the orthogonal code hopping patterns hops independently in the orthogonal code hopping multiplexing communications.

18. (Previously Presented) The method of claim 16,

wherein the orthogonal code hopping patterns hop to avoid collisions in the orthogonal code hopping multiplexing communications.

19. (Previously Presented) The method of claim 3,

wherein the orthogonal code hopping patterns are periodically repeated in a frame unit.

20. (Previously Presented) The method of claim 19,

wherein the frame unit comprises an independent data unit based on channel encoding.

21. (Currently Amended) The method of claim 14,

wherein the ~~first~~ primary communication station detects a hopping pattern collision caused by the random orthogonal code hopping patterns in advance to avoid transmitting a corresponding dispreading data symbol.

22. (Currently Amended) The method of claim 14, further comprising:

comparing ~~despreading~~ data symbols at a time of a hopping pattern collision caused by the random orthogonal code hopping patterns in order to transmit the data symbols when all of the data symbols are the same.

23. (Currently Amended) The method of claim 14, further comprising:

comparing ~~despreading~~ data symbols at a time of a hopping pattern collision caused by the random orthogonal code hopping patterns in order to not transmit the data symbols when the data symbols are not the same.

24. (Previously Presented) The method of claim 23, further comprising:

increasing a transmission power of a data symbol next to the data symbols, which are not transmitted because of discordance of the despreading data symbols at a time of the hopping pattern collision.

25. (Previously Presented) The method of claim 24,

wherein the transmission power is increased in accordance with a first system parameter during a period provided in accordance with a second system parameter.

26. (Currently Amended) The method of claim 25,

wherein the first system parameter and the second system parameter comprise position functions of the not-transmitted ~~dispreading~~ data symbols.

27. (Previously Presented) The method of claim 26,

wherein the first system parameter and the second system parameter are at least 0.

28. (Currently Amended) The method of claim 21,

wherein the hopping pattern collision is detected when there is a possibility that ~~sending~~ transmitting antenna beams of the first communication station are superposed so to cause an error in a channel decoding process of at least one of the second communication stations.

29. (Currently Amended) The method of claim 28,

wherein a pilot signal is used for initial ~~synchronous gain~~ acquisition and tracking of the channels and ~~synchronous decoding~~ coherent detection of the channels owing to phase distortion compensation.

30. (Currently Amended) The method of claim 29,

wherein the pilot ~~system~~ signal employs a ~~non-collision~~ collision-free hopping pattern for preventing a loss of ~~the~~ compensation capability for phase distortion ~~compensation~~ due to collision.

31. (Currently Amended) The method of claim 30,

wherein the ~~non-collision~~ collision-free hopping pattern comprises a fixed orthogonal ~~code symbol~~ codeword allocation.

32. (Currently Amended) ~~A transmitter in a band spreading communications system including a first communication station and at least one second communication station, the transmitter comprising:~~ An apparatus for orthogonal code hopping multiplexing communications in spread spectrum communication systems including a primary communication station and secondary communication stations, having communication channels from the primary communication station to the secondary communication station, the primary communication station including a transmitter, the apparatus comprising:

a channel encoder ~~for coding a channel~~;

an orthogonal code hopping pattern generator for generating an orthogonal code hopping pattern;

an orthogonal code generator for generating an orthogonal ~~code symbol~~ codeword according to the orthogonal hopping pattern; and

an ~~orthogonal code~~ collision detector for detecting [[a]] ~~collision~~ collisions of ~~involving~~ the hopping pattern.

a collision detector for detecting collisions of the hopping patterns;

wherein the transmitter comprises

a divider and allocator for dividing the orthogonal codewords into a first orthogonal codeword group for orthogonal code division multiplexing using fixed allocation and a second orthogonal codeword group for statistical multiplexing based on orthogonal code hopping multiplexing using orthogonal code hopping patterns.

33. (Currently Amended) The apparatus of claim 32, further comprising:

~~an interrupter for interrupting a send signal~~ a transmission controller for transmitting or perforating the data symbols according to an output of the orthogonal code collision detector.

34. (Currently Amended) The ~~transmitter~~ apparatus of claim 33,

wherein the ~~orthogonal code~~ collision detector comprises a ~~despreading~~ data symbol comparator for determining whether ~~despreading~~ spread data symbols of corresponding channels are the same at [[a]] the time of a hopping pattern collision; and

wherein the ~~interrupter interrupts the send signal~~ transmission controller does not transmit the data symbols when the ~~dispreading~~ spread data symbol comparator determines that the corresponding ~~despreading~~ data symbols are not the same.

35. (Currently Amended) ~~A receiver in a band spreading communications system including a first communication station and at least one second~~ The apparatus as claimed in claim 32, wherein one of the secondary communication ~~station~~ stations includes a receiver, the receiver comprising:

a channel decoder ~~for coding a channel~~;

an orthogonal code hopping pattern generator for generating an orthogonal code hopping pattern; and

an orthogonal code generator for generating an orthogonal ~~code symbol~~ codeword according to the orthogonal hopping pattern.

wherein the channel is distinguished with use of the orthogonal code hopping patterns generated at random.

36. (Cancelled)

37. (Currently Amended) The method of claim [[36]] 45, further comprising:

performing the orthogonal code division multiplexing by fixedly allocating the orthogonal ~~code symbols~~ codewords in the first orthogonal ~~code symbol~~ codeword group to ~~a channel~~ channels having [[a]] high data activity.

38. (Currently Amended) The method of claim [[36]] 45, further comprising:

performing an orthogonal code hopping multiplexing for a channel having a low data activity according to an orthogonal code hopping pattern by using only orthogonal ~~code symbols~~ codewords in the second orthogonal ~~code symbol~~ codeword group.

39. (Currently Amended) The method of claim [[36]] 45,

wherein at least one orthogonal code comprises an orthogonal variable spreading factor code.

40. (Currently Amended) The method of claim [[36]] 45,

wherein the first orthogonal ~~code symbol~~ codeword group consists of child codes generated from one parent code in a hierarchical orthogonal code generating tree structure according to variable spreading factors; and

wherein the second orthogonal ~~code symbol~~ codeword group consists of remaining orthogonal code symbols.

41. (Currently Amended) The method of claim [[36]] 45,

wherein the first orthogonal ~~code symbol~~ codeword group comprises a variable spreading ~~gain~~ factor according to a ~~send~~ transmission data rate.

42. (Cancelled)

43. (Currently Amended) The method of claim [[36]] 45,

wherein the channel for the orthogonal code hopping multiplexing comprises a fixed data rate,

~~the method further comprising selecting orthogonal code symbols having the same spreading factor in the second orthogonal code symbol group~~.

44. (Currently Amended) The method of claim 40,

~~wherein the channel for the orthogonal code hopping multiplexing comprises a fixed data rate,~~

~~the method~~ further comprising selecting orthogonal ~~code symbols~~ codewords having the same spreading factor in the second orthogonal ~~code symbol~~ codeword group.

45. (New) A method for orthogonal code hopping multiplexing communications in a spread spectrum communication system including a primary communication station and

secondary communication stations having communication channels from the primary communication station to the second communication stations, the method comprising:

generating orthogonal code hopping patterns;

generating orthogonal codewords according to the orthogonal code hopping patterns;

dividing the orthogonal codewords into a first orthogonal codeword group for orthogonal code division multiplexing, the orthogonal codewords in the first orthogonal codeword group being fixedly allocated to a channel having a high data activity in communications for performing the orthogonal code division multiplexing, and into a second orthogonal codeword group for statistical multiplexing based on orthogonal code hopping multiplexing, the orthogonal codewords in the second orthogonal codeword group being used to perform orthogonal code hopping multiplexing for a channel having a low data activity according to the orthogonal code hopping pattern generated at random,

wherein a hopping pattern collision caused by the independent orthogonal code hopping patterns is detected in advance in order not to transmit a corresponding data symbol.